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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,209	02/07/2002	Mark Ayres	495812001200	7088

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EXAMINER	
AMARI, ALESSANDRO V	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,209	AYRES ET AL.	
	Examiner	Art Unit	
	Alessandro V. Amari	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-18,21-34,36-38 and 41* is/are rejected.

7)☒ Claim(s) *15,19,20,35,39,40 and 42-52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-14, 16-18, 21-34, 36, 37, 38 and 41 stand rejected under 35 U.S.C. 102(b) as being anticipated by Burr et al US Patent 6,175,543.

In regard to claims 1 and 21, Burr et al discloses (see Figure 2) an associative write verify system or a method for an associative write verify system for a holographic recording medium, comprising a hologram (30), an object beam (24), a reference beam (25), a probe beam as described in column 7, lines 36-45, a reconstituted reference beam as described in column 7, lines 36-4 and a means for comparing the reference beam with the reconstituted reference beam (33), as described in column 7, lines 18-24, 36-45, 58-67 and column 8, lines 1-26 and wherein the system implements an associative write verify during holographic recording.

Regarding claims 2 and 22, Burr et al discloses a stored address with a one-to-one correspondence to the reference beam as described in column 6, lines 13-32, 63-67 and column 7, lines 1-5.

Regarding claims 3 and 23, Burr et al discloses a code comprising a data pattern within the object beam as described in column 6, lines 50-62.

Regarding claims 4 and 24, Burr et al discloses that the probe beam is modulated to match the code as described in column 7, lines 36-45.

Regarding claims 5 and 25, Burr et al discloses that the means for comparing the reference beam with the reconstituted reference beam comprises means for detecting

the reconstituted reference beam as described in column 7, lines 18-24, 58-67 and column 8, lines 1-26.

Regarding claims 6 and 26, Burr et al discloses that the associative write verify is selected from the group consisting of a parallel associative write verify, a post-glimpse page-wise verify and combinations thereof as described in column 7, lines 37-67 and column 8, lines 1-38.

Regarding claims 7 and 27, Burr et al discloses that the stored address corresponds to a hologram page or a reference beam angle used to record a hologram page as described in column 9, lines 8-67 and column 9, lines 1-15.

Regarding claims 8 and 28, Burr et al discloses that the stored address is stored in a microprocessor RAM memory or in a portion of the holographic recording medium as described in column 9, lines 38-67 and column 10, lines 1-27.

Regarding claims 9 and 29, Burr et al discloses that the code is a pattern in a hologram page or information from different hologram pages as described in column 9, lines 38-67 and column 10, lines 1-27.

Regarding claims 10 and 30, Burr et al teaches that the probe beam is generated by an object beam modulator as described in column 7, lines 36-45.

Regarding claims 11 and 31, Burr et al discloses that the reference beam is a plane wave reference beam generated using scanning mirrors or an array of laser beam generators as described in column 7, lines 11-25.

Regarding claims 12 and 32, Burr et al discloses that the reconstituted reference beam is collected by a lens as described in column 7, lines 14-18.

Regarding claims 13 and 33, Burr et al discloses that said means for comparing the reference beam with the reconstituted reference beam comprises a hardware or software comparator as described in column 7, lines 58-67 and column 8, lines 1-5. Although the prior art does not specifically disclose the claimed comparator, this feature is seen to be an inherent teaching of that device since a means for comparing the reference beams is disclosed and it is apparent that some type of comparator must be present for the device to function as intended.

Regarding claims 14 and 34, Burr et al discloses means for associative, post-glimpse page wise verify as described in column 7, lines 37-46.

Regarding claims 16 and 36, Burr et al discloses that the holographic recording medium is an optically flat planar medium as shown in Figure 2.

Regarding claims 17 and 37, Burr et al discloses that the reconstituted reference beam is detected with a photodetector as described in column 6, lines 13-32.

Regarding claims 18 and 38, Burr et al discloses the holographic recording medium comprises a polymer matrix as described in column 6, lines 1-2.

Regarding claim 41, Burr et al discloses that the system has a probe pattern and or geometry capable of detecting and identifying the reconstituted reference beam as shown in Figure 2 and as described in column 7, lines 37-46.

Allowable Subject Matter

2. Claims 15, 19, 20, 35, 39, 40 and 42-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. Claims 15 and 35 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "detection of the reconstituted reference beam while an original data pattern remains on the modulator after writing" as set forth in the claimed combination.

Claims 19 and 39 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "has a Rayleigh ratio of less than 7×10^{-3} cm^{-1}" as set forth in the claimed combination.

Claims 20 and 40 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "medium has a thickness greater than 200 μm and a refractive index contrast of 3×10^{-3} or higher" as set forth in the claimed combination.

Claim 42 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "lens to intercept the reconstituted reference beam and focus the reconstituted reference beam into a resolvable spot on a detector array, the reconstituted reference beam being a plane wave" as set forth in the claimed combination.

Claim 43 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "collecting the reconstituted reference beam with a lens and imaging an origin of the spherical beam onto a detector, the reconstituted reference beam being a spherical beam" as set forth in the claimed combination.

Claim 44 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "separating the propagating modes of the

reconstituted reference beam into separated mode reconstituted reference beams" as set forth in the claimed combination.

Claim 45 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "one or more substantially mutually orthogonal modulation codes for marking a copyright status of data" as set forth in the claimed combination.

Claim 46 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "the reconstituted reference beam upon a holographic optical element, wherein the reconstituted reference beam is recorded with a corresponding collimated or spherical index beam" as set forth in the claimed combination. Claim 47 is also allowable based upon its dependence on claim 46.

Claim 48 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "impinging the reconstituted reference beams upon a grating or prism whereby individual reconstituted reference beams of differing wavelengths are separated" as set forth in the claimed combination.

Claim 49 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "marking a copyright status of data within a page recorded in the holographic recording medium and determining whether the data is under copyright restriction" as set forth in the claimed combination. Claims 50-52 are also allowable based upon its dependence on claim 49.

The prior art of record, Burr et al teaches an associative write verify system or a method for an associative write verify system for a holographic recording medium,

comprising a hologram, an object beam, a reference beam, a probe beam, a reconstituted reference beam and a means for comparing the reference beam with the reconstituted reference beam, and wherein the system implements an associative write verify during holographic recording. However, Burr et al does not teach the limitations regarding the reconstituted reference beam or the copyright status or in regard to the Rayleigh ratio or the thickness of the medium and the refractive index contrast and there is no motivation or teaching to modify this difference as derived.

Response to Arguments

4. Applicant's arguments filed 03 December 2003 have been fully considered but they are not persuasive.

The Applicant argues that the prior art, Burr et al teaches a variety of techniques to improve the performance of content-addressable holographic memories which are purported to improve the correlation signal-to-noise ratio during an associative read or search operation but does not disclose that its system implements an associative write verify during holographic recording as claimed. Furthermore, the Applicant argues that the associative write verify technique of Burr does not necessarily even function as a content addressable memory during read operations.

In response to these arguments, the Examiner would like to point out that the rejection is based upon the claim recitation. Burr et al in column 7, lines 36-45, states:

> "Once the interference fringes formed by the two coherent beams 24a and 25a are preserved in photosensitive material of hologram storage volume 30, reference beam 25 is blocked and a set of search data is arrayed onto SLM 28.

> The beam modulated by the search data arrayed on SLM 28 is projected into hologram storage 30 and reconstructs a set of output reference beams 33. Preferably, optics 32 used to store the reference beam allows reconstructed beams 33 to be focused on correlation detector array 34 without any intervening optics."

Thus, Burr et al clearly discloses implementing an associative write verify during holographic recording because when the set of search data is arrayed onto the SLM, the beam modulated by the search data arrayed on the SLM (i.e., the probe beam) generates reconstituted reference beams which are focused on a correlation detector array (i.e., means for comparing the reference beam with the reconstituted reference beam) for the purpose of optical correlation. It is this optical correlation function which implements the associative write verify, in that the correlation detector generates correlation signals from a query image, which are then matched (i.e., associative function) to stored images and thus verified (see also column 7, lines 18-24 of Burr et al).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava
03 March 2004

MARK A. ROBINSON
PRIMARY EXAMINER